

**REMARKS**

Claim 7 has been amended in order to more particularly point out, and distinctly claim the subject matter to which the applicant regards as his invention. The applicant respectfully submits that no new matter has been added. It is believed that this Amendment is fully responsive to the Office Action dated **June 10, 2004**.

**Allowable Subject Matter**

Claims 1-6 are allowed. Further, claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 7 has been amended to include all the features of claim 8 and claim 8 has been canceled. Therefore, allowance of independent claim 7 is respectfully requested.

**Claim Rejections under 35 USC §103**

Claims 7 and 9 are rejected under 35 USC §103(a) as being unpatentable over Taguchi (U.S. Patent No. 5,457,327) in view of Nakamura et al. (U.S. Patent No. 5,543,629).

The present invention as recited in claim 7 is an avalanche photodiode (17) having a semiconductor substrate (1) and a photo absorbing layer (12) formed over the semiconductor substrate (1) and having a film thickness of more than 0.15  $\mu\text{m}$  but less than 0.2  $\mu\text{m}$ . Further included in this avalanche photodiode (17) is a carrier multiplying layer (15) formed over the photo

absorbing layer (12) and having a film thickness of more than 0.07  $\mu\text{m}$  but less than 0.1  $\mu\text{m}$ . Still further included in this avalanche photodiode (17) is a heterobarrier relaxing layer (13) formed on the photo absorbing layer (12) and a field dropping layer (14) formed on the heterobarrier relaxing layer (13) in which the carrier multiplying layer (15) is formed on the field dropping layer (14).

Taguchi describes an avalanche photodiode having a substrate (31) having a buffer layer (32) having a thickness of 1 micrometer and an absorption layer (33) having a thickness of 1.3 micrometers. This avalanche photodiode has a field relaxation layer (34) having a thickness of 800 angstrom and a multiplication layer (35) placed on the field relaxation layer (34).

Nakamura et al. an avalanche photodiode having a multiplication layer with a thickness of 0.5  $\mu\text{m}$  or less and a light absorption layer with a thickness of 1  $\mu\text{m}$  or less.

As previously discussed, claim 7 has been amended to include all the features of claim 8 and claim 8 has been canceled. Therefore, withdrawal of the rejection of claims 7 and 9 under 35 USC §103(a) as being unpatentable over Taguchi (U.S. Patent No. 5,457,327) in view of Nakamura et al. (U.S. Patent No. 5,543,629) is respectfully requested.

**Conclusion**

In view of the aforementioned amendments and accompanying remarks, claim 7, as amended, is in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicant's undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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